

Operations 101

Oroville Facilities

Curtis Creel
Plenary Presentation
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Operational Strategy

- Long-term (Annual)
- Mid-term (Monthly)
- Short-term (Weekly/Daily)

Operational Strategy

- **Long-term (Annual)**
 - Define conservation storage targets
 - Determine SWP allocation capability
 - Develop SWP Outage Plans
 - Analyze operational resource needs
- **Mid-term (Monthly)**
- **Short-term (Weekly/Daily)**

Annual Operations Strategy

- **Objective: Maximize water supply benefits**
- **Subject to constraints:**
 - **Regulatory**
 - **Environmental**
 - **Physical/operational**

Annual Operations Strategy

- **Winter/spring Goal: Store water for dry-period demands**
- **Actions taken to achieve goal:**
 - Minimize Oroville releases
 - Maximize Delta exports
- **Result:**
 - San Luis Reservoir high point ~ mid-April
 - Oroville high point by early summer

Annual Operations Strategy

- **Summer/fall Goal: Meet dry-period requirements**
- **Actions taken to achieve goal:**
 - **Maximize Oroville releases during summer**
 - **Maximize San Luis releases during summer**
- **Result:**
 - **Storage in both Oroville and San Luis reach low point**
 - **Split between reservoirs based by “carryover” target**

Oroville Storage Target

- **Links operation of one year to the next**
- **Current method:**
 - Reserve 1/2 of available storage above 1.0 MAF for subsequent years' water supply
 - Storage recover occurs during wet conditions

State Water Project Allocations

- Initial allocation determined December 1 using conservative estimate of hydrology.
- Allocation increases or decreases are determined monthly using very conservative estimates of hydrology.
- Final allocation typically made in May, but...

Operational Strategy

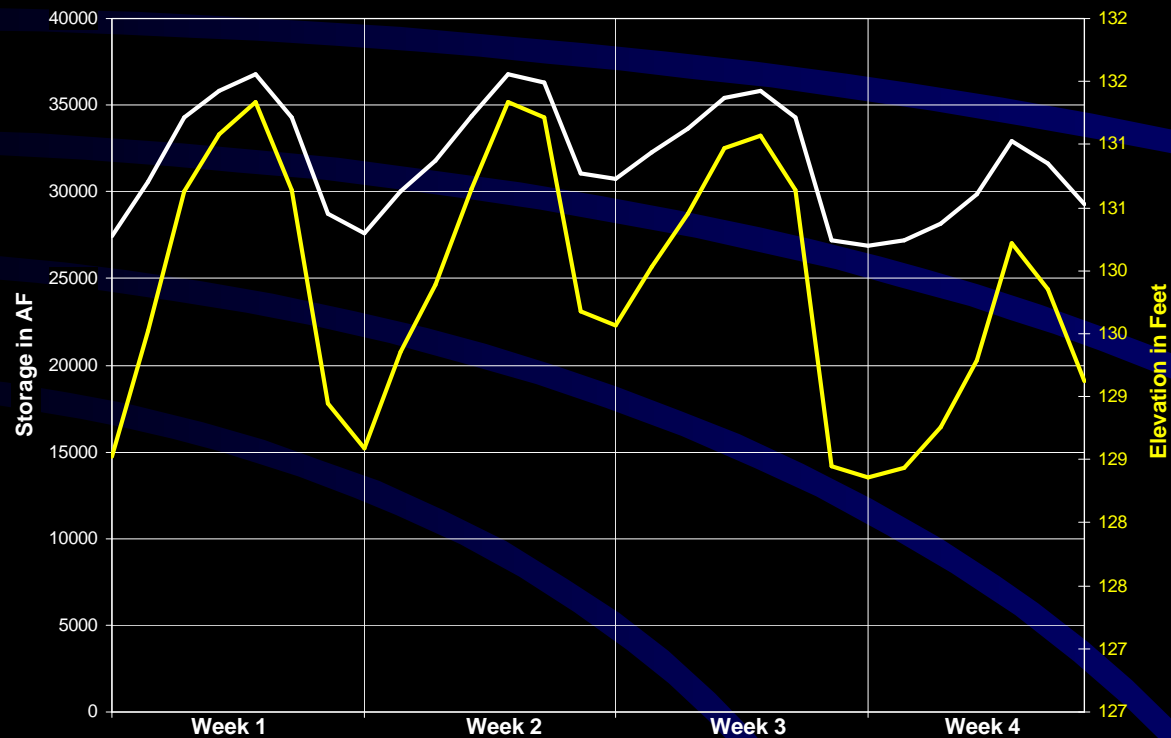
- **Long-term (Annual)**
- **Mid-term (Monthly)**
 - Adjust releases to optimize water operations and accomplish long-term goals
 - Refine “Requirements”
- **Short-term (Weekly/Daily)**

Operational Strategy

- Long-term (Annual)
- Mid-term (Monthly)
- Short-term (Weekly/Daily)
 - Adjust releases for instream/downstream requirements
 - Power production fits within water supply strategy

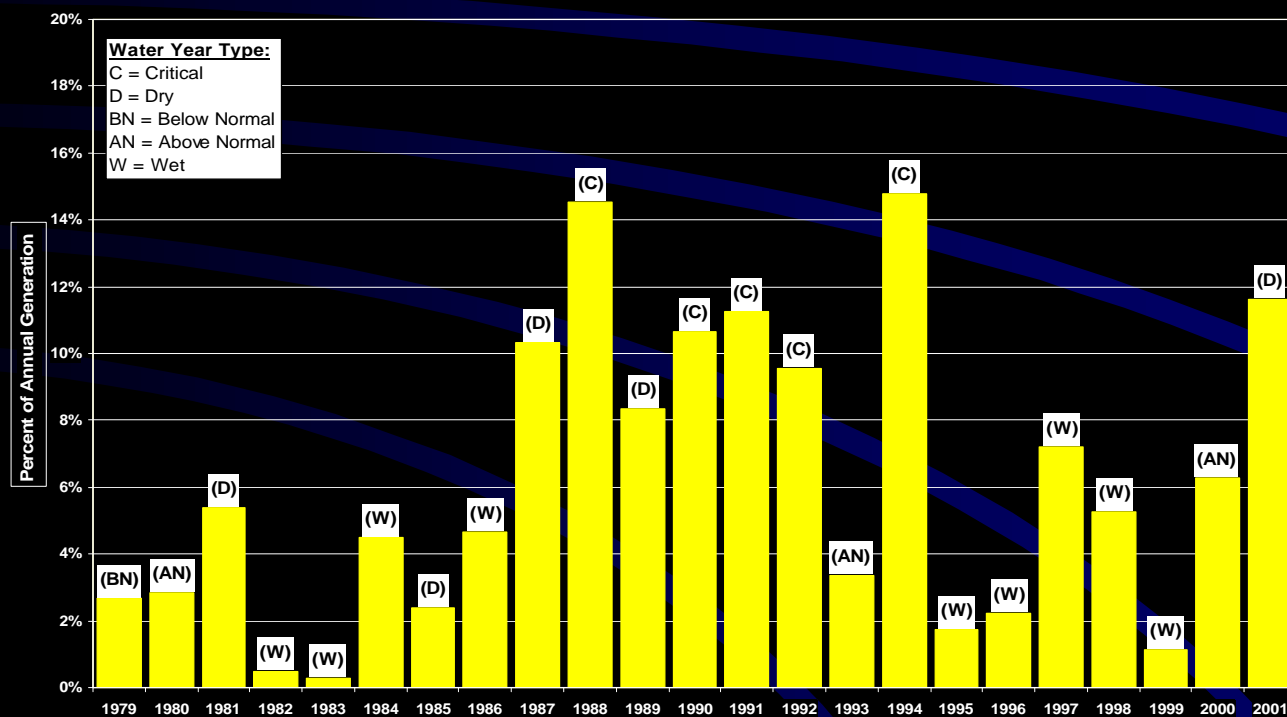
Operational Strategy

Typical Thermalito Afterbay Pattern



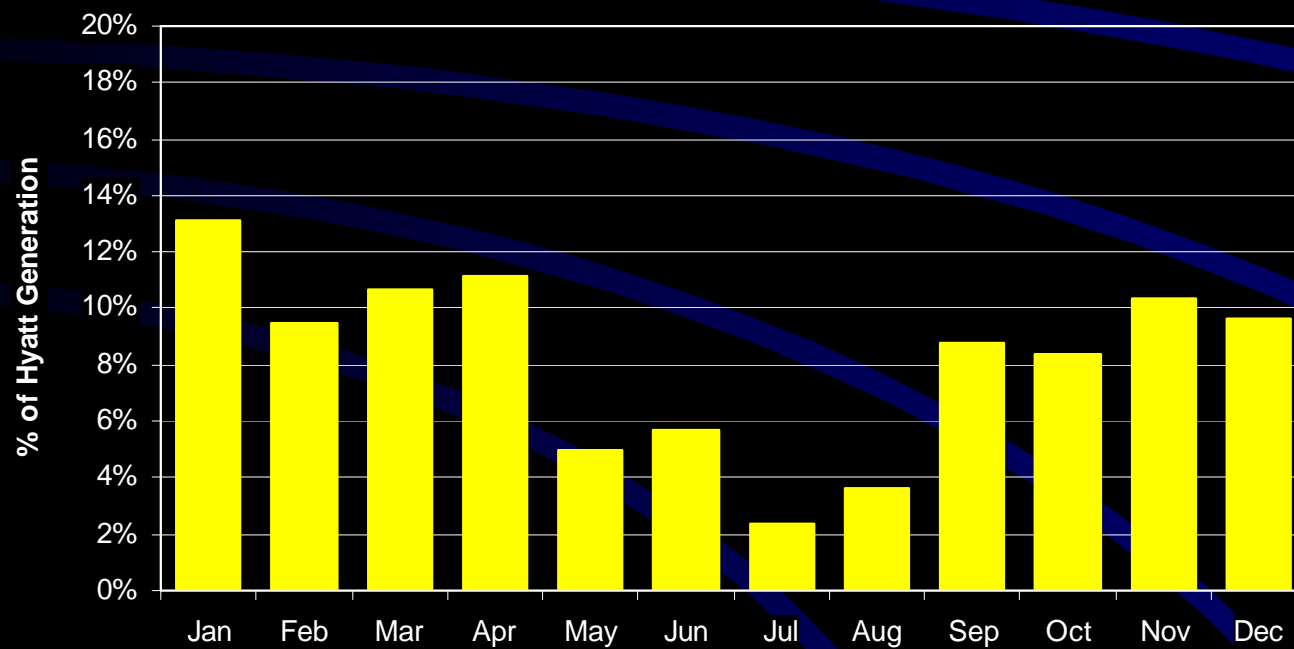
Operational Strategy

1979-2001: Hyatt Annual Pumpback Operations



Operational Strategy

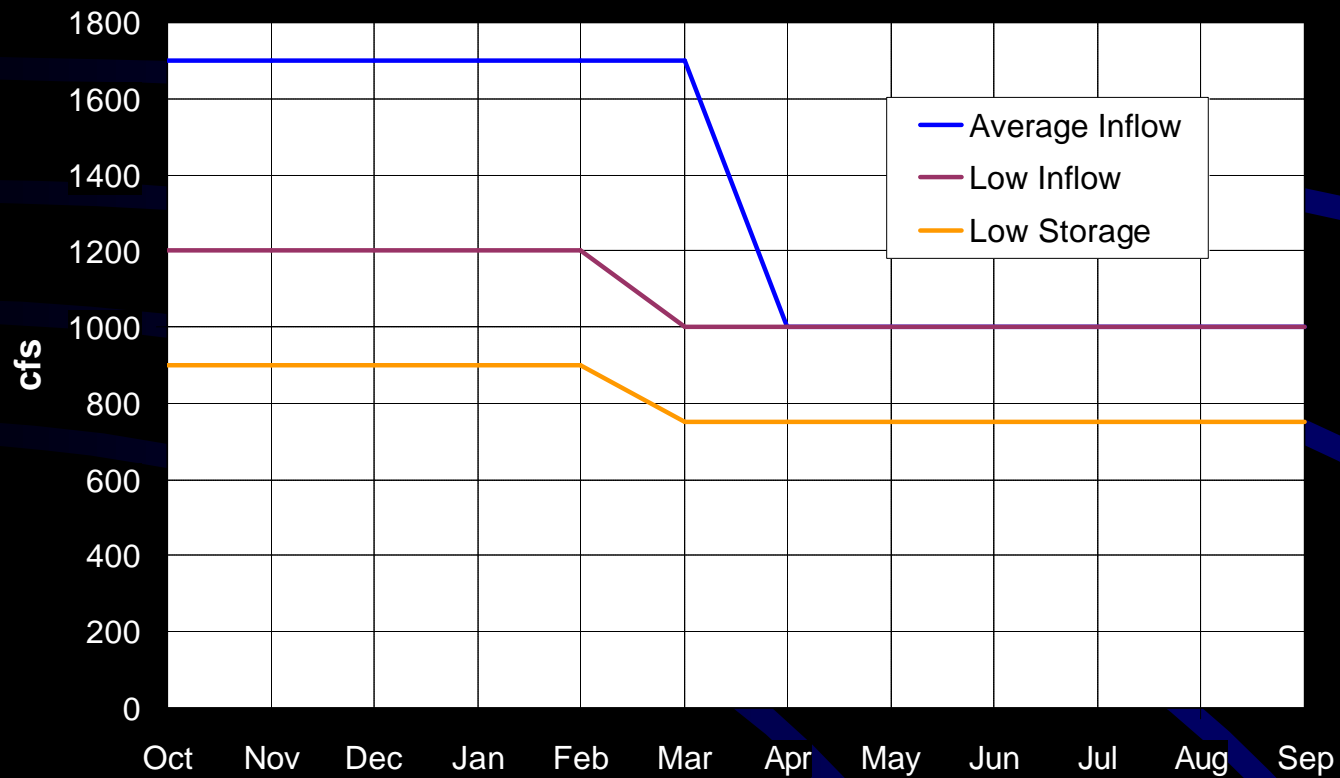
Hyatt Pumpback Operation
1979 - 2001 Average



Why is water released from Lake Oroville?

- **Meet local water supply demands**
- **Meet instream requirements**

Instream Flow Requirements (Feather River)



Why is water released from Lake Oroville?

- **Meet local water supply demands**
- **Meet instream requirements**
- **Meet downstream requirements**

Bay-Delta Standards

Contained in D-1641

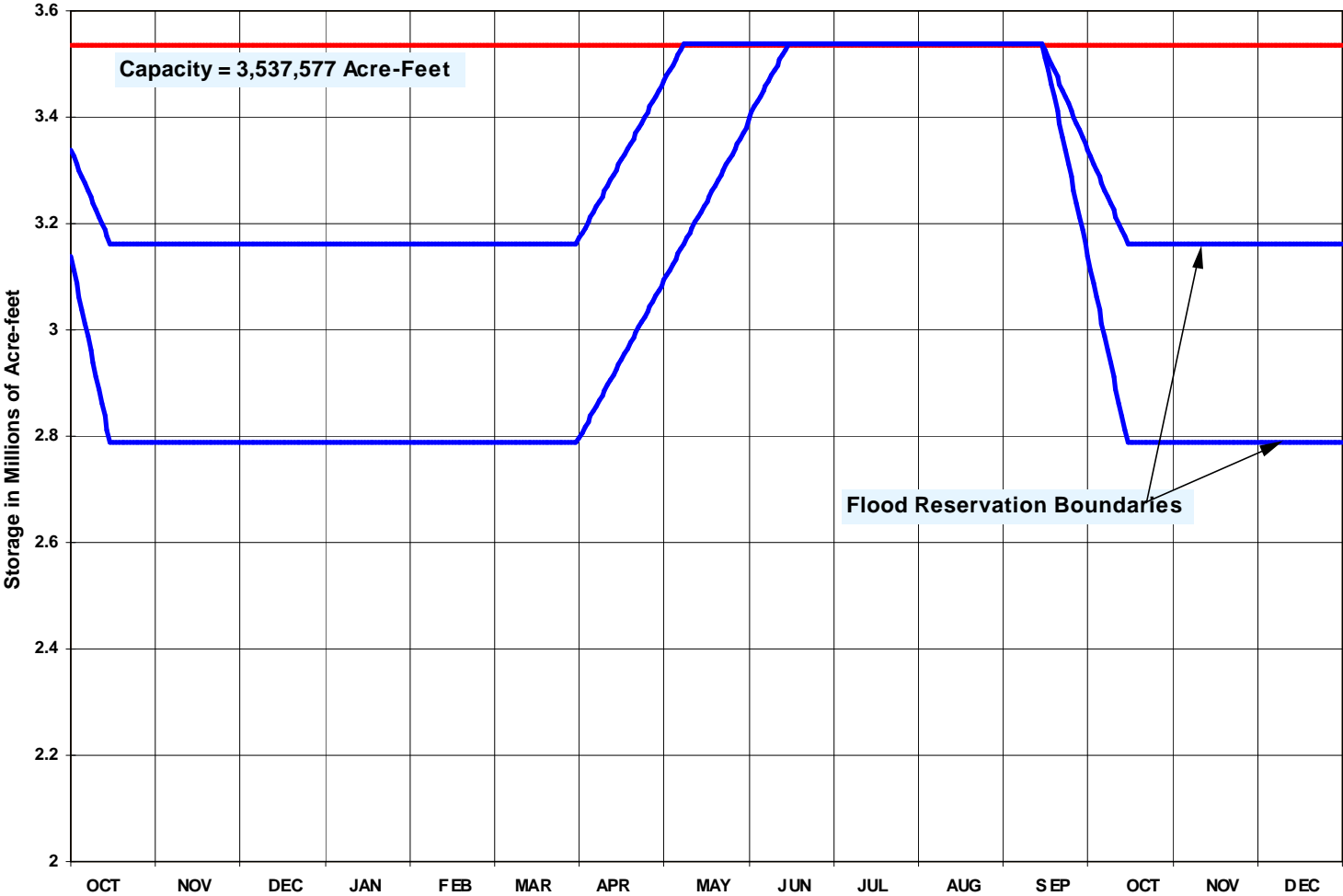
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CRITERIA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FLOW/OPERATIONAL												
• Fish and Wildlife												
SWP/CVP Export Limits				1,500cfs [1]								
Export/Inflow Ratio [2]	65%		35% of Delta Inflow [3]					65% of Delta Inflow				
Minimum Delta Outflow	[4]							3,000 - 8,000 cfs [4]				
Habitat Protection Outflow			7,100 - 29,200 cfs [5]									
Salinity Starting Condition [6]		[6]										
River Flows:												
@ Rio Vista								3,000 - 4,500 cfs [7]				
@ Vernalis - Base		710 - 3,420 cfs [8]				[8]						
- Pulse				[9]				+28TAP				
Delta Cross Channel Gates	[10]		Closed			[11]				Conditional [10]		
WATER QUALITY STANDARDS												
• Municipal and Industrial												
All Export Locations								≤ 250 mg/l Cl				
Contra Costa Canal								150 mg/l Cl for the required number of days [12]				
• Agriculture												
Western/Interior Delta								Max.14-day average EC mmhos/cm [13]				
Southern Delta [14]		1.0 mS				30 day running avg EC 0.7 mS				1.0 mS		
• Fish and Wildlife												
San Joaquin River Salinity [15]					14-day avg: 0.44 EC							
Suisun Marsh Salinity [16]	12.5 EC	8.0 EC		11.0 EC					19.0 EC	[17]		15.5 EC

Why is water released from Lake Oroville?

- Meet local water supply demands
- Meet instream requirements
- Meet downstream requirements
- Flood Control

Lake Oroville Flood Control Reservation



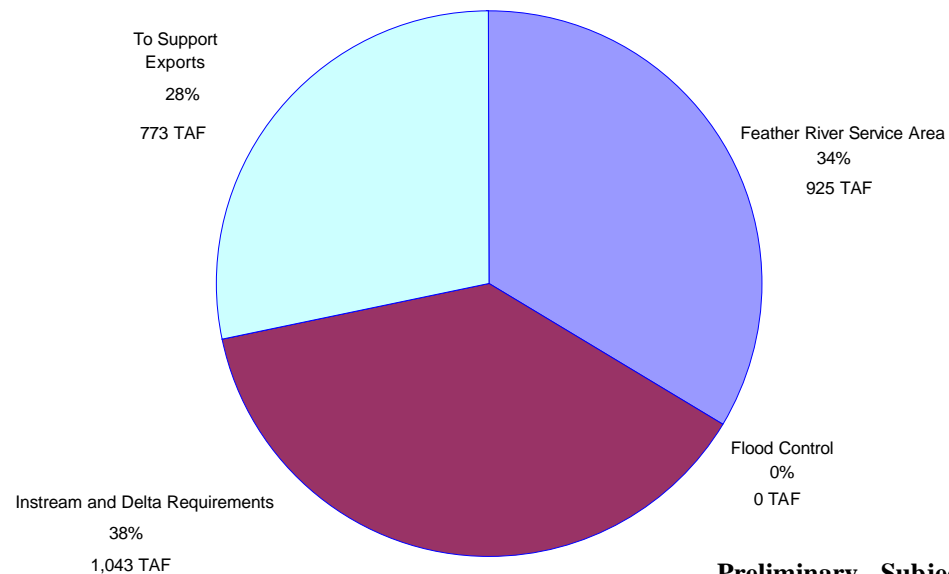
Why is water released from Lake Oroville?

- **Meet local water supply demands**
- **Meet instream requirements**
- **Meet downstream requirements**
- **Flood Control**
- **Support SWP water supply targets**

Why is water released from Lake Oroville?

Primary Reasons for Lake Oroville Releases in Calendar Year 2002

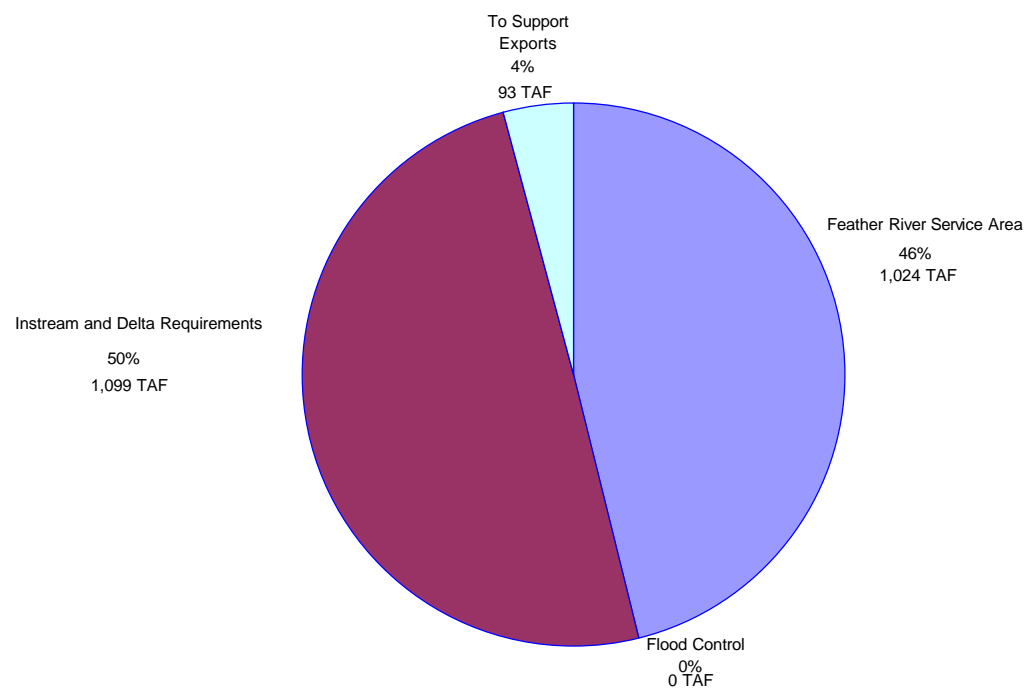
(Actuals through August; September through December assumes 90% exceedence forecast)



Preliminary - Subject to Change

Why is water released from Lake Oroville?

**Primary Reasons for Lake Oroville Releases
in Calendar Year 2001**



Lake Oroville Storage

October 1, 1999 through December 31, 2000

